Firepower Symposium

The Road To The Objective Force "Armaments for the Army Transformation"

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Vanguard For Army Transformation
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**Title and Subtitle**
The Road To The Objective Force "Armaments for the Army Transformation"  

**Author(s)**
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**Performing Organization Name(s) and Address(es)**
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**Abstract**

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UU

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Army Vision Statement

“The Best Off-shelf Technology Available Today,” The IBCTs Will Bridge That Operational Shortfall And Help Meet Warfighting And Contingency Needs For The Next Twenty-plus Years. This Interim Force Will Also Serve As The Experimental Vanguard For The Objective Force. It Will Validate Operational And Organizational Concepts, Training And Leader Development Initiatives, And Deployment Scenarios For The Next Nine Years As We Await The Arrival Of The Objective Force.

We Are Once Again An Army Between The Wars, And Once Again, We Are Challenged To Adjust To Break Old Paradigms. So We Are Transforming To Become Strategically Responsive And Remain Dominant Across The Entire Spectrum Of Military Operations –”

General Eric K. Shinseki
AUSA Mid-Winter Conference
Fort Lauderdale, FL 2 March 01
The Army Transformation

Legacy Force

Objective Force

Interim Force

Sustain & Recapitalize

Transform

S&T

R&D

Procurement

2000

First Interim BCT

2003

First Unit Equipped Objective

... Responsive, Deployable, Agile, Versatile, Lethal, Survivable, Sustainable

Vanguard For Army Transformation
Organizational Structure
GM GDLS Defense Group L.L.C., & ASA(ALT)/PEO/PM

CSA
- SEC Army
  - AAE
    - LTG Paul Kern MilDep AAE
    - MG Joseph Yakovac PEO GCSS
      - COL Joe Rodriguez TSM
      - COL David Ogg Project Manager BCT

GM GDLS Defense Group L.L.C.
- Mr. Charlie Hall Chairperson, President, CEO
- Mr. Bill Pettipas Senior GM Member LLC
- Mr. Don Howe BCT Program Director

Contract between U.S. Army & GM GDLS Defense Group L.L.C.

Vanguard For Army Transformation
GM GDLS Team

GM GDLS Defense Group LLC, Joint Venture

D. Steckle / T. Frey Engineering
C. Hastie / B. Motala Materials
D. Minnema / T. Plunkett Production
B. Drake / L. Meese Supportability
T. Bento / J. Ebert Contracts
A. DelBen / S. Young Finance

T. Mcleod Contracts
M. Tillman Finance
N. Thorpe Legal
E. Jones Office Admin
T. Eagleson GMD PM
R. Wyrembelski GDLS PM
D. Hickmott Finance
D. Fillip Contracts
TBD Customer Liaison
K. Sandberg Risk Mgmt

Vanguard For Army Transformation
GM GDLS Work Scope Summary

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Supportability:
- GD Fielding Team
- Shared Training
- GM Site Management
- FSR Provisioning
- TMDE IETMs
- Equip Spt Spares
- Tech Manuals

Delivery Orders to date – 9 (vehicles; nonrecurring; and services)

Total vehicles on order – 413
User Involvement

Proposed Change

Trade-Analysis
Valid Reqmt? (TSM)
Within cost, schedule? (PM)

Technically Feasible? GM/GDLS
No Other System/Product Impacts? (IPT)

Product IPT
- System Impacts
- Validation of Trades Analysis

Impacts Accepted
Change Incorporated When Feasible

Yes
Change Incorporated When Feasible

No
Change Returned to IPT with Impact Assessment

User Input Required to Ensure Vehicles are Suitable and Effective

Vanguard For Army Transformation
The Interim Armored Vehicle Family

Infantry Carrier Vehicle (ICV)
- 8x8 Wheeled w/CTIS & Run Flat
- High Hard Steel Structure
- Remote Weapon Station with cal .50 MG or MK19 40mm

Mobile Gun System (MGS)
- Low Profile Turret
- M68A1 Cannon w/Autoloader
- Full Solution Fire Control

Brigade Configuration

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<td>ICV</td>
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<td>IBCTs</td>
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# Integrated Program Summary

## Program Milestones

**ICV, MC, CV, RV**
- Initial Production
- Full Production
- Block Modification/Retrofit

**MEV, ESV, ATGM**
- Initial Production
- Full Production

**FSV**
- Initial Production
- Full Production

**NBCRV**
- Sensor Dev/ Veh Int
- Initial Production
- Full Production

**Bunker Buster**
- TOW Dev
- Prod

**MGS**
- Development
- Initial Production
- Full Production

### Comparative Evaluation
- Gov’t Dev Test
- Modeling & Simulation/ Evaluation/DOTE
- 30 Days at Congress
- Before Ordering 3rd Bde

### Timeline

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<th>CY04</th>
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<td>FY08</td>
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- **MS II**
- **IPR (55)**
- **IPR (29)**
- **IPR (80)**
- **MS III**
Design to Delivery

User Requirements

Award Contract

Request for Proposal

10 Months

1st Vehicle Delivery

We Are Here

Vanguard For Army Transformation
Interim Armored Vehicle (IAV) Virtual Environment

Contractor

System Design & Integration
- 3-D CAD representation
- Design Tradeoffs
- Stowage & HFE

Ground Truth
- Man-In-The-loop Simulators
- Test Design

Virtual Proving Ground

User Representation
- HFE
- User jury
- Stowage
- Usability

FT. LEWIS
FT. SILL
FT. SAM HOUSTON
FT. BENNING
FT. KNOX
TSM IAV

Motion Base Dynamics
- HFE
- Design Tradeoffs
- User Jury
- Block Improvements

Evaluations in CAVE

Immersive Environments
- Design Tradeoffs
- Design Reviews
- Block Modifications

Vanguard For Army Transformation
**Utilization**

- C4ISR subsystem Interoperability
- Human factors (HFE)
- Training
- Documentation (manuals, operator guides)
- Networking (USG, GM GDLS, Subcontractors, 24/7)

**Features**

- Mobile
- Configure for bench testing
- Rapid variant reconfiguration
- Full scale environment

*Vanguard For Army Transformation*
Fielding at Ft Lewis
- Force Modernization Process-

ALL PARTIES:
Maintain Visibility
Over Entire Process

**Synchronize Fielding (Materiel Directorate-BCC)**
* ID fielding window with BDE
* Synchronize PM
* Inform Materiel Developer

(Facilitate / De-conflict)

**Execute Fielding (Materiel Developer/PM)**
* De-process
* Conduct NET
* Field (hand off & support through NET)
* Hand off TPF packages

Coordinate W/Unit (Force Mod/G-7)
* Close coordination W/Unit
* Set up NMIB (G7)
* Coordinate for Resources (G3)

**ALL PARTIES:**
Maintain Visibility
Over Entire Process

Vanguard For Army Transformation
IAV Supportability & Training Objectives

- Use Established Sources for Existing NSNs
- CLS for Supply of New NSNs
- IAW Performance Parameters
- Organic Field Level Maintenance with Contractor Field Service Rep Assistance
- CLS for Repair of New LRUs
- Instructor & Key Personnel Training New Equipment Training and Institutional Training
- Training Aids and Devices Interface

Supply | Maintenance | Training

Enablers | Efficiencies

Vanguard For Army Transformation
IAV Common & Integrated Capabilities

Commonality
- Interoperable with ABCS (KPP)
- C-130 Transportable (KPP)
- IAV Maximum Commonality at System, Subsystem, TMDE, Parts, Tools, Skills And Tasks

Fire Support Vehicle
- Striker - Coordinated Fire Support Planning and Execution

Medical Evacuation Vehicle
- 4 Litter Evacuation Capability

Engineer Squad Vehicle
- Transports Engineer Squad & Equipment +2-man Crew
- Mine Neutralization Kit

Mobile Gun System
- Bunker Busting Capability (KPP)
- Penetrate Reinforced Concrete Wall to Allow Infantry Access
- Provides Direct Fire Support to Dismounted Infantry

Bottom Line: Mission Equipment Packages Make The Variants Unique

Vanguard For Army Transformation
**Technical Characteristics**

**Infantry Carrier Vehicle**

<table>
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<tr>
<th><strong>Supportability</strong></th>
<th><strong>Transportability</strong></th>
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<tr>
<td>Embedded IETMs Block Improvement</td>
<td>37,798 lbs Combat Weight</td>
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<tr>
<td>Diagnostics Linked To VDT</td>
<td>37,618 lbs Transport Weight</td>
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<tr>
<td>BIT/ Power Pack Display</td>
<td>50% Fuel</td>
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<tr>
<th><strong>Mission Capability</strong></th>
<th><strong>Mobility</strong></th>
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<tr>
<td>Carries 9 Man Infantry Squad And Crew of 2</td>
<td>60 MPH Top Speed</td>
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<tr>
<td>Kongsberg Remote Weapon</td>
<td>9 Sec 50m Dash</td>
</tr>
<tr>
<td>Station With M2 .50 cal MG Or MK19 40mm</td>
<td>78 in Gap Crossing</td>
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<tr>
<td>2000 rnds .50 Cal or</td>
<td>23 in Vertical Climb</td>
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<tr>
<td>448 rnds 40mm</td>
<td>330 Mile Cruising Range est.</td>
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<tr>
<td>2 Javelin Missiles</td>
<td>53 Gal Fuel Capacity</td>
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<th><strong>Survivability</strong></th>
<th><strong>IAV Common</strong></th>
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<td>14.5 mm AP Protection</td>
<td>GFE/ASIOE</td>
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<tr>
<td>High Hard Steel Structure</td>
<td>FBCB2</td>
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<td>MEXAS Ceramic Layer</td>
<td>EPLRS</td>
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<tr>
<td>Spall Liner</td>
<td>GPS</td>
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<tr>
<td>IBD Passive RPG Add-on</td>
<td>TWS-H</td>
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**Vanguard For Army Transformation**
Infantry Carrier Variant

ICV Serves as the Baseline Vehicle (Enhanced Commonality)

Key Performance Parameters

- 9-Man Squad with their Equipment
- C-130 Air Transportable
- System Interoperability
Automotive

- Sprint Capability - 50 meters in 9 seconds
- Sustained Maximum Speed > 60mph
- Cruise at 40mph for 330+ miles
- 4WD Selectable 8WD
- 2 Speed Transfer Case
- Hydro Pneumatic Suspension
- Height Management System
- Air Transport
- Load Leveling
Caterpillar 3126 engine
- 350 hp @ 2600 rpm
- 820 ft lbs @ 1440 rpm
Allison MD3066P Transmission
- 6 speeds fwd
- 1 speed reverse
- 2 x PTO driving hydraulic accessories

---

**Engine Cooling Fan**

**Radiator**

**Air Cleaner**

**Hydraulic reservoir**

**CAT 3126 Engine**

**Alternator**

**Allison Transmission**
- KDA Remote Weapon Station
  - M2 .50 cal
  - Mk19 mod 3 40mm
- Defeat light armored targets at 1500m
- -20° depression to + 60° elevation
- Targets acquired and engaged from under armor
MORTAR CARRIER (Initial)
- M121 120mm Dismounted Mortar
- 81mm Dismounted (Battalion)
- 60mm Dismounted (Company)
- Storage for Improved Munitions

MORTAR CARRIER (Block Improvement)
- Soltam 120mm Recoil Mortar System
- 81mm Dismounted (Infantry Battalion Carrier)
- 60mm Dismounted (Infantry Company Carrier)
- XM95 Mortar Fire Control System
- Storage for Improved Munitions
ANTI-TANK GUIDED MISSILE VEHICLE

- TOWII
- ITAS (Raytheon) - 2 Missiles
- IBAS Day Camera
- Missile is Remotely Fired Under Armor
- M6 Smoke Grenade Launchers

* ATGM does not incorporate the RWS

Vanguard For Army Transformation
Situational Awareness

RECONNAISSANCE VEHICLE
- Integrated LRAS3

COMMANDER’S VEHICLE
- Full C4ISR Suite including workstations

FIRE SUPPORT VEHICLE
- Integrated M707 Striker
- Mounting position allows growth to Striker Sabre / masted system
Support Elements

ENGINEER SUPPORT VEHICLE

- Vehicle Array Mine Detection System (VAMIDS)
- Tele-Operation, Mark IV Robotic System (Omnitech)
- Advanced Hornet System
- Obstacle Neutralization System
  - Magnetic Signature Duplicator
  - Pearson Surface Mine Plow
  - Light Weight Mine Roller
  - Lane Marking System
- M15/M21 Anti-tank Mines
Support Elements

**NBC RECONNAISSANCE VEHICLE**
- Overpressure and Climate Control System
- Government Directed, CACI Developed Digital Suite and Sensors
- Lightweight Chemical Agent Detector and Display
- Radiation Detector(s) AN/VDR-2 and AN/VDR-13
- Autonomous Navigational Device

**MEDICAL EVACUATION VEHICLE**
- Litters for four patients
- Seating for six ambulatory patients

Vanguard For Army Transformation
# Technical Characteristics

## Mobile Gun System

### Supportability
- IETMs on Video Display Terminal (VDT) for 3/2 ID and 1/25 ID
- Embedded IETMs Block Improvement
- Diagnostics Linked To VDT
- BIT/BITE Power Pack Display

### Mission Capability
- Low Profile Turret
- M68A1 Cannon w/Autoloader
- Coax 7.62mm, Secondary CDR’s MG
- Full Solution Fire Control,
  - 2 Axis Stabilization
  - 18 rnds 105mm
  - 4200 rnds 7.62mm

### Survivability
- 14.5 mm AP Protection
- High Hard Steel Structure
- MEXAS Ceramic Layer
- Kevlar Spall Liner
- IBD Passive RPG Add-on

### Transportability
- 41,300 lbs Combat Weight
- 38,000 lbs Transport Weight
- 25% Fuel
- 5 rnds 105mm
- 500 rnds 7.62mm
- 200 rnds .50 cal
- All remaining Ammo Removed
- Crew Gear Restowed
- Winch Removed

### Mobility
- 60 MPH Top Speed
- 9 Sec 50m Dash
- 78 in Gap Crossing
- 23 in Vertical Climb
- 330 Mile Cruising Range
- 53 Gal Fuel Capacity

### MGS Specific GFE/ASIOE
- M68A1
- ELRF
Mobile Gun System Variant

• Low Profile Turret
  – External Modified M68 105mm gun
  – Protected 8 round autoloader
  – Versatile lethality with growth
  – Stabilized direct fire control
  – Low profile, side-by-side crew

• ICV Variant Chassis
  – Modified production chassis
  – Lowered for C130/survivability
  – Isolated 10 round replenisher low in back

• MGS Vehicle
  – 18 auto loaded rounds
  – 3 crew
  – GVW/performance ~same as ICV
  – LPT on LAV III demonstrated performance
MGS LPT Weapon Lethality

- M68A1 105mm cannon with muzzle brake
- Fires all NATO ammo present and future
- 8-round autoloader, 10 rds/min
- 10-round replenisher with manual bypass
- All ammo protected by spall liners

Fully Automated, Protected, MBT Firepower

Vanguard For Army Transformation
MGS LPT Fire Control

- 2 axis stabilized gunner's sight
  - Latest thermal technology
  - 2 power viewing
  - Eye safe laser range finder
  - Muzzle reference sensor
- Turret and gun stabilized
- 7x auxiliary sight
  - Available to both crewmen
- Panoramic viewer
  - Mounts high on gun pod
  - Day video and thermal

State-Of-The-Art Fire Control